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OSEC 2022
Open Science European Conference

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OUVRIR LA SCIENCE !

évaluation et qualité
Hcéres

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The role of Infrastructure for Software in Open Science

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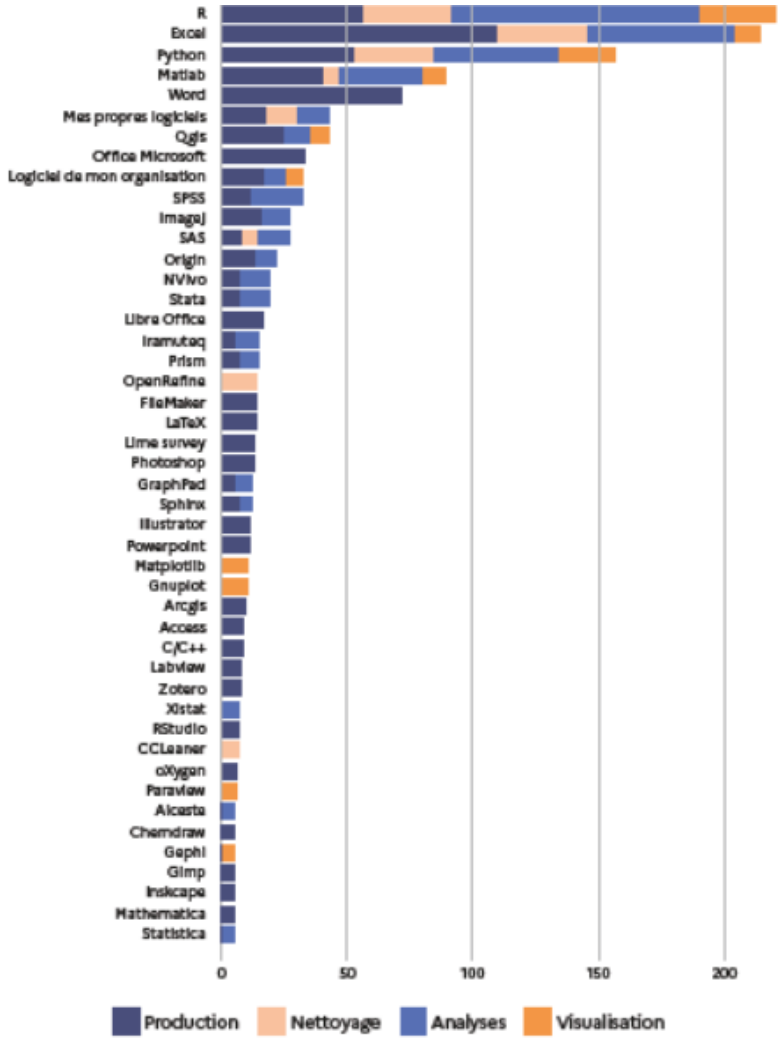
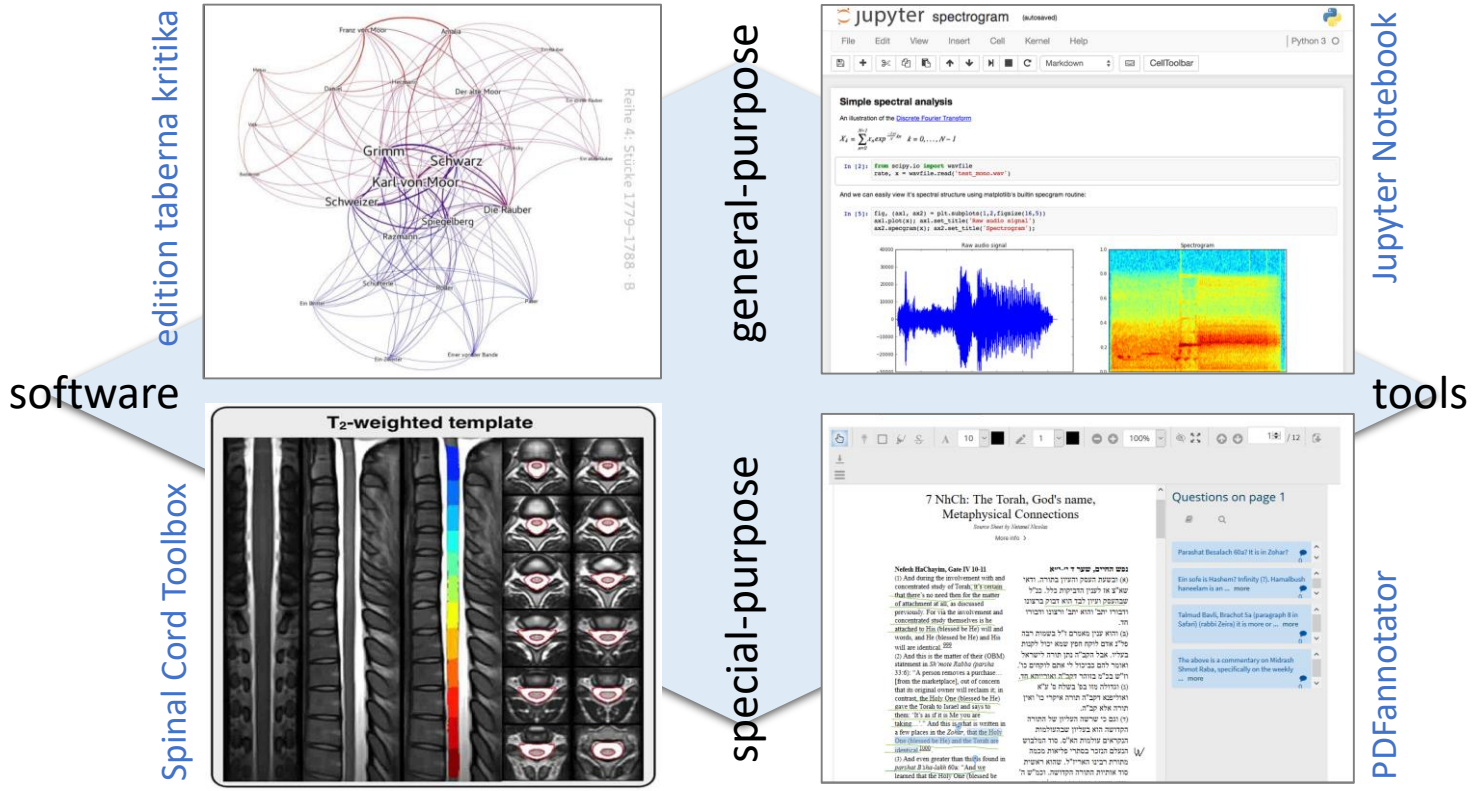
Software in Research



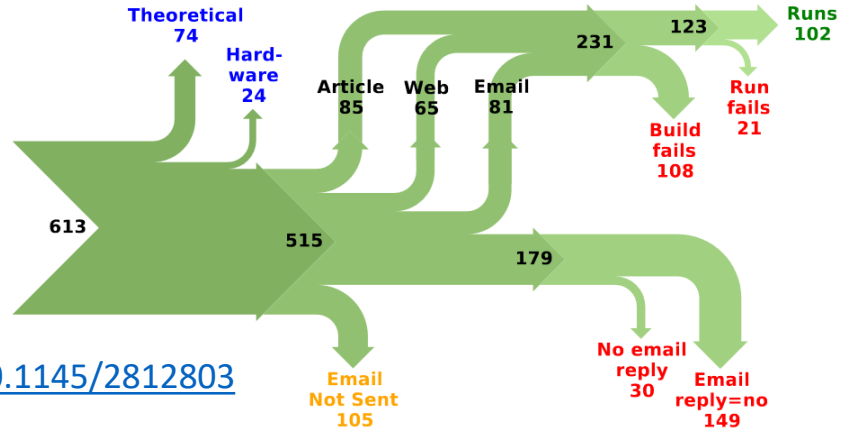
https://tinyurl.com/opensciencepractices



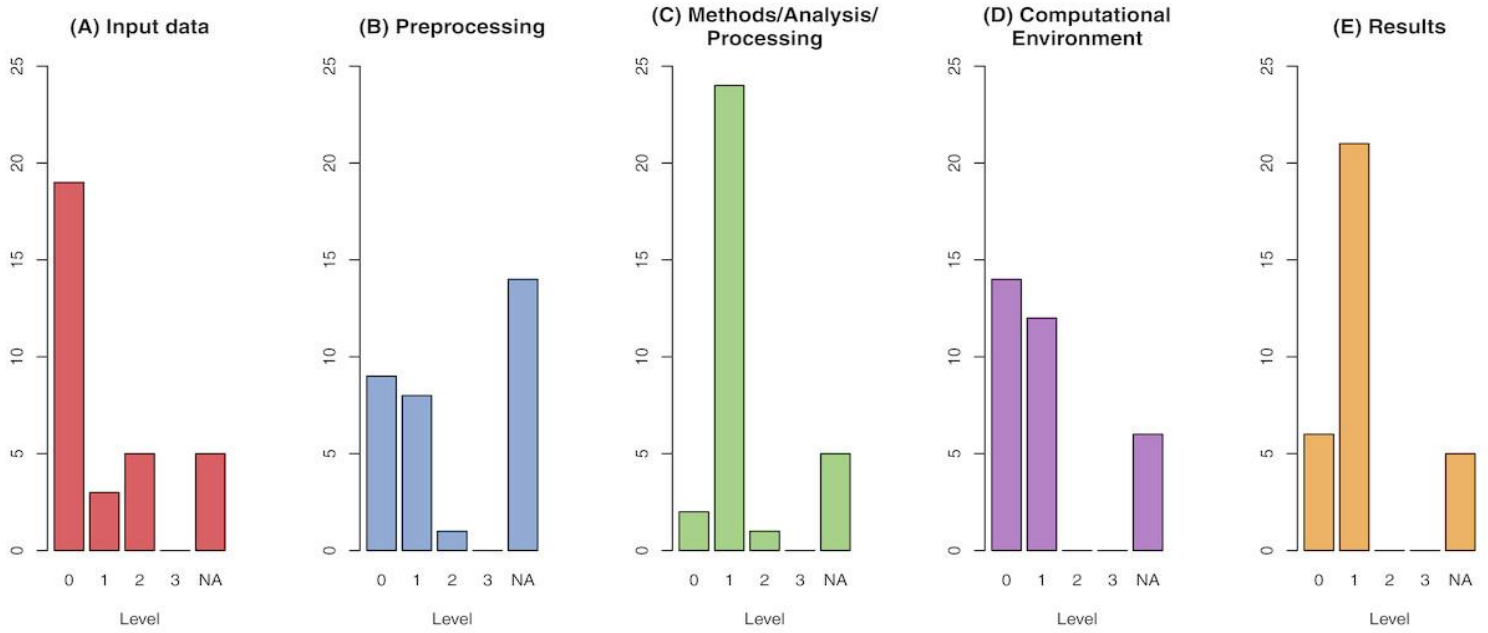
Diversity is necessary for research, but a challenge for sustainability.

Issues with Software and Reproducibility

- Time is money … in project work plans as well as for individual researchers.
- Coding practices vary widely across disciplines.
- And coding is not the same as software engineering.
- Documentation and testing are necessary for quality assurance.



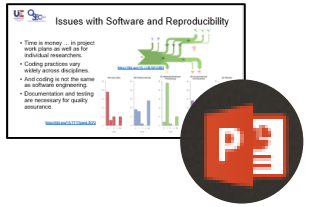
https://doi.org/10.1145/2812803

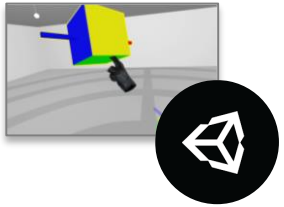


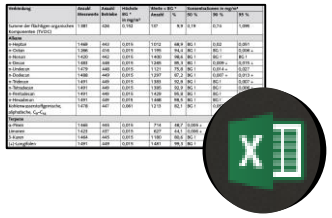
https://doi.org/10.7717/peerj.5072

Issues with Tools and Reproducibility

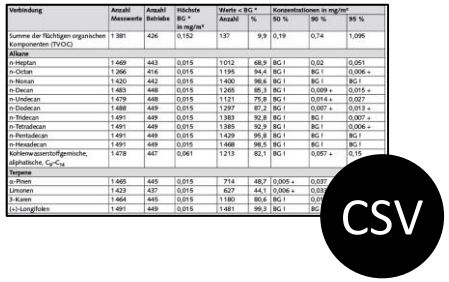
Proprietary data formats are often tied to specific software.

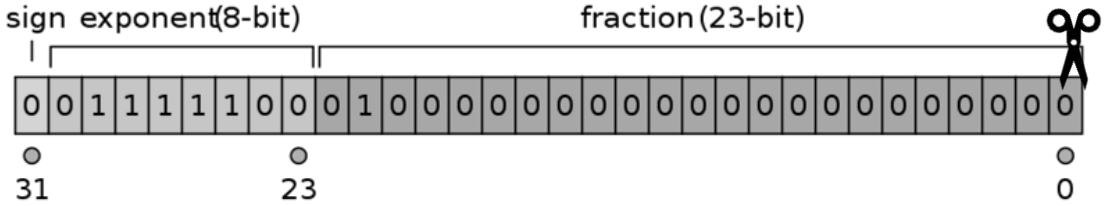






Open data formats can be tied to specific versions of software.

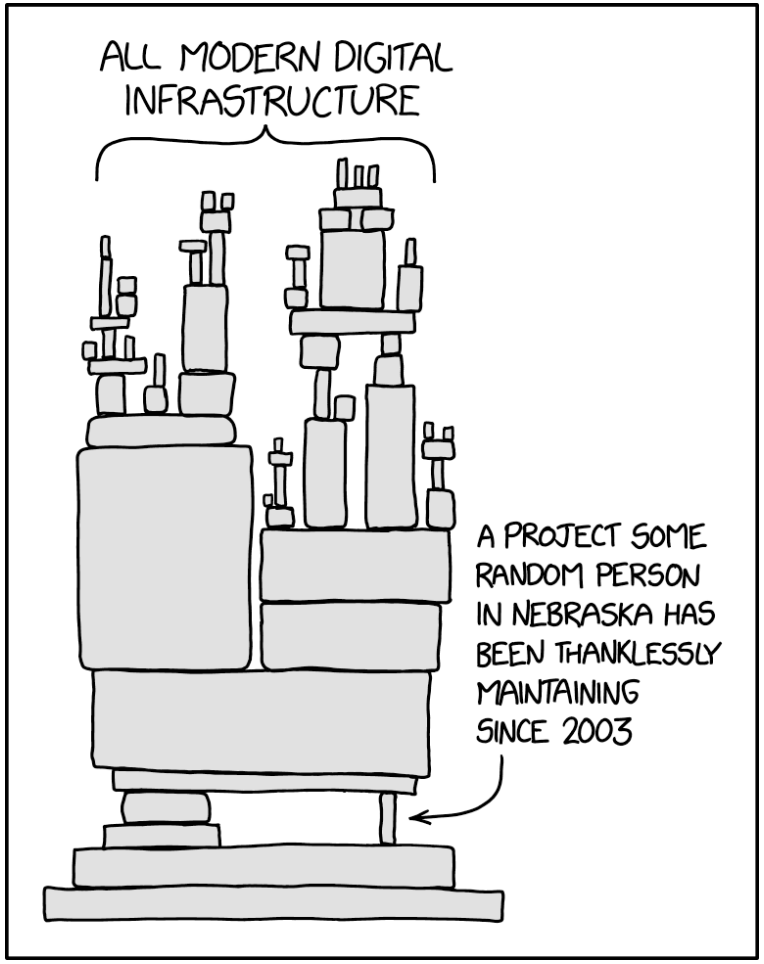




Software is tied to specific execution enviroments.

Dealing with data, tools etc. requires dedicated literacy.

Fragile Constructions



https://xkcd.com/2347/

Heartbleed

log4j

fMRI bug

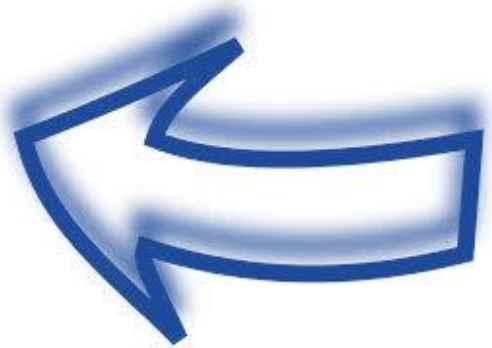
Valuable research funding is waisted
when basic building blocks in software crash!

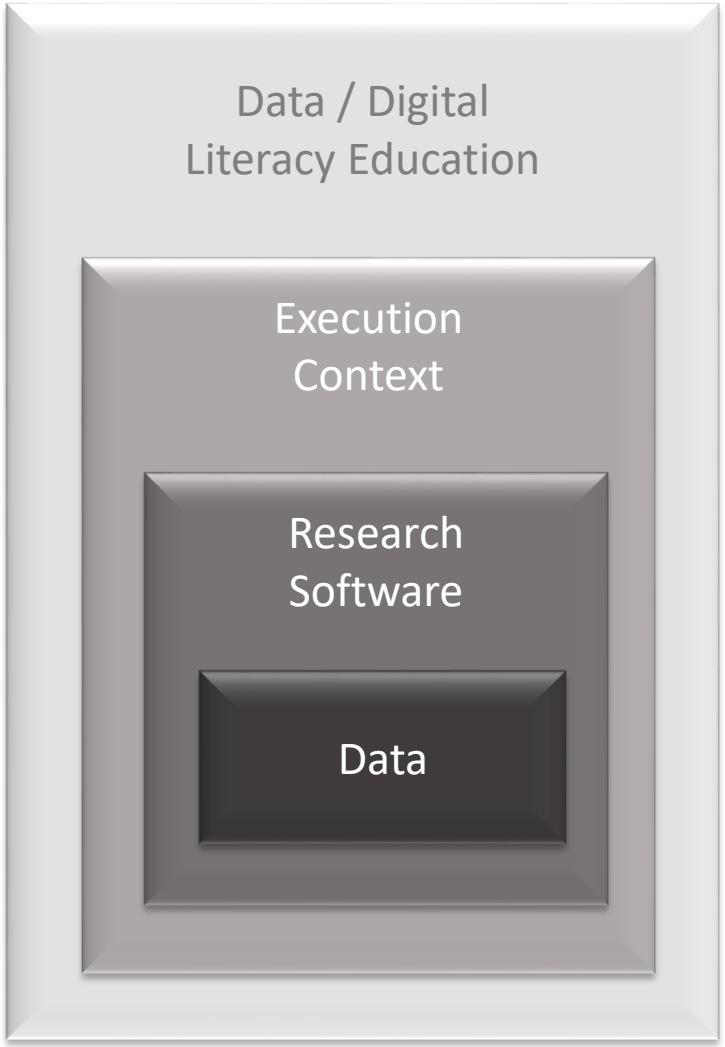
Solutions – Technical Perspective

Packaging of
- Data
- Software
- Context

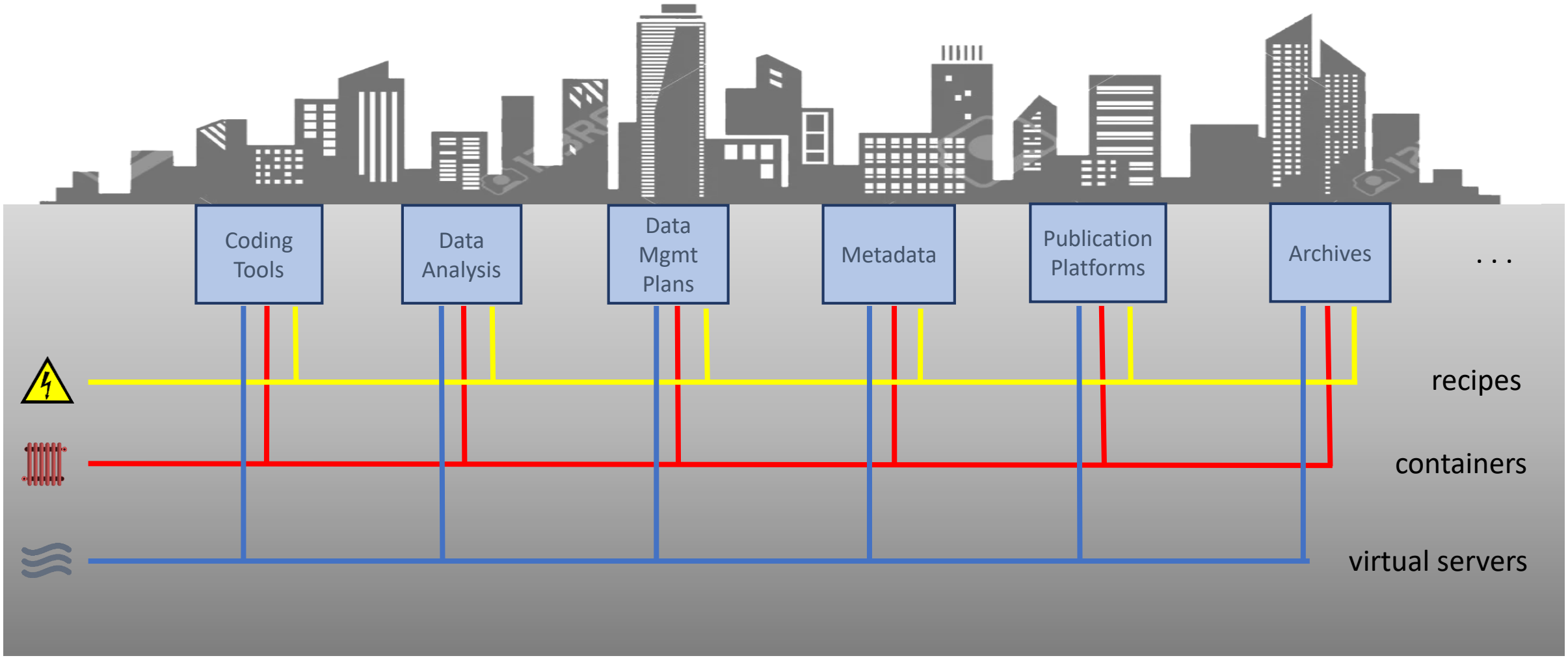
in containers

→Infrastructure for container management





IT Infrastructure



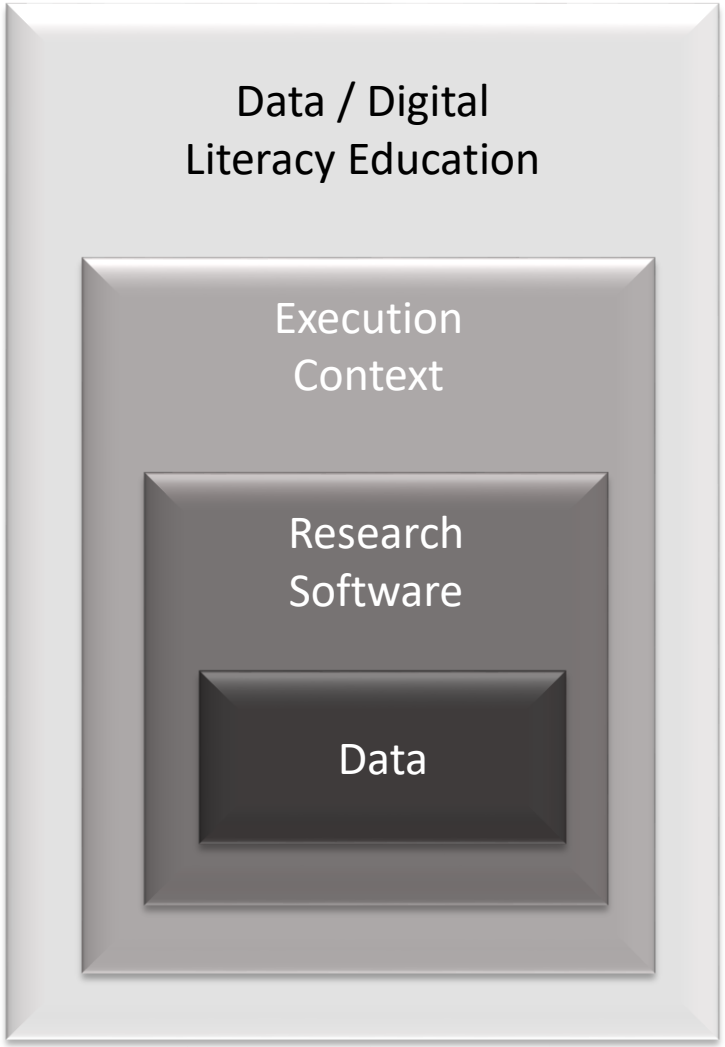
Solutions – Educational Perspective

Dedicated knowledge & skills for

- Data-driven research
- Software engineering
- Computational infrastructure

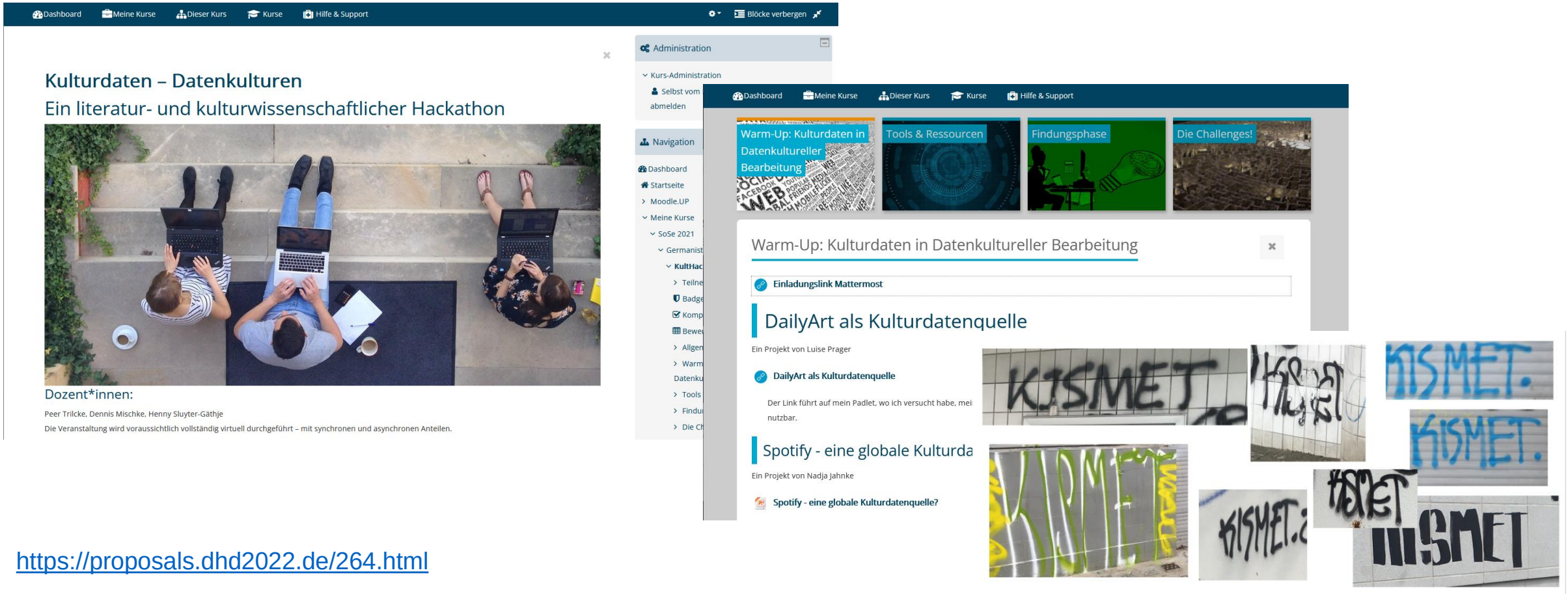
in research

→Skill development in data & digital literacy



Coding Skills in Academic Curricula

Hackathon «Cultural Data – Data Cultures» (Digital Humanities)



https://proposals.dhd2022.de/264.html

Three Wishes to the Fairy

1. Recognize the production of research software as a result of research.
   (time, funding, skills, …)

2. Recognize the availability of research software as valuable outcome.
   («publication» counts, metrics, appointment procedures, …)

3. Recognize the quality of research software as an important issue.
   (coding practices, IT infrastructures, support structures, …)

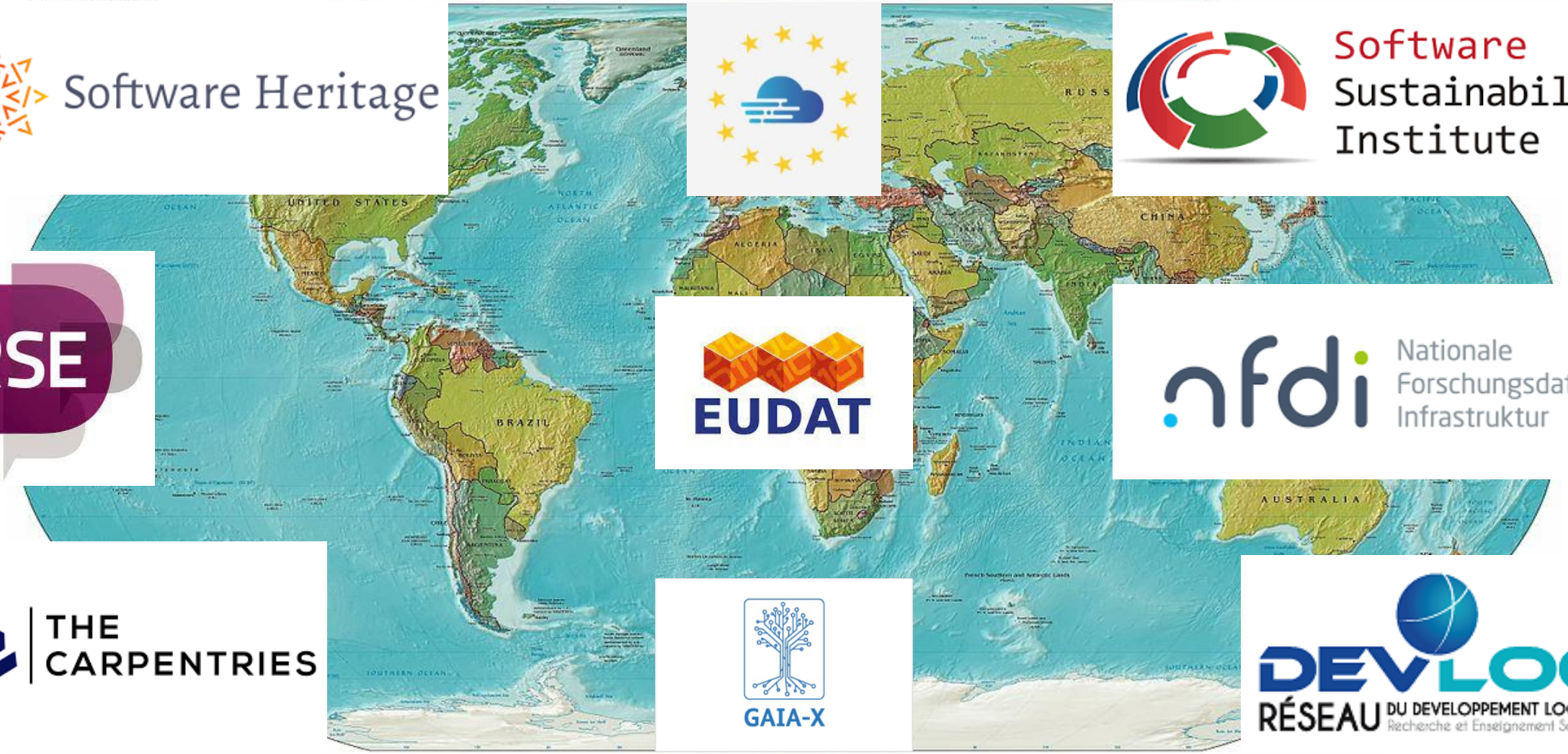
Recognize software as a first-class citizen.

May I have Three More?

4. Increase the maturity and integration of current infrastructure & tools.
   (Identify and further promote promising approaches.)
5. Adapt the funding instruments to digital infrastructure.
   (Add development and maintenance costs to currently predominant human costs.)
6. Establish international collaboration in infrastructure for research software.
   (Bring together relevant stakeholders and support their work.)

Promote the basic infrastructure for research software.

There are Plenty of us!



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